

**REMARKS**

The Official Action mailed March 14, 2002 has been received and its contents carefully noted. Filed concurrently herewith is a *Request for Continued Examination (RCE)* and *Request for Two Month Extension of Time*, which extends the shortened statutory period for response to August 13, 2002. Accordingly, Applicant respectfully submits that this response is being timely filed.

Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on February 20, 1996 and December 11, 1997. However, Applicant has not received acknowledgement of the Information Disclosure Statement filed on December 28, 1999. Applicant respectfully requests that the Examiner provide a copy of the initialed Form PTO-1449 evidencing consideration of this Information Disclosure Statement with the following action.

Claims 1-59 are pending in the present application, of which claims 1, 5, 8-9, 15, 19, 22-23, 29, 31 and 36 are independent. All independent claims have been amended herewith to recite a blocking layer formed on an insulating substrate under the semiconductor film. For the reasons set forth in detail below, these claims are believed to be in condition for allowance.

Paragraph 2 of the Official Action rejects claims 5 and 19 as anticipated or, in the alternative, as obvious based on JP 2-143572 to Koji. Initially, it is noted that an *Information Disclosure Statement* is submitted herewith together with a full English translation of JP 2-143572 and review and consideration of this reference is respectfully requested.

The Official Action asserts that Koji discloses a device for sensing a light as presently claimed. It is well established that "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). It is noted that Koji teaches that the semiconductor island is directly formed on the rough surface of the insulating substrate rather than on a blocking layer formed over an insulating substrate as recited in all independent claims. Therefore, it is respectfully submitted that Koji cannot anticipate claims 5 and 19 and favorable reconsideration is requested in view thereof.

With reference to the rejection of claims 5 and 19 as obvious based on Koji, it is further noted that paragraph 5 of the Official Action rejects claims 1-4, 6-8, 15-18, 20-22, 29-30, 41-45 and 49-55 as obvious based on the combination of Koji and U.S. Patent 4,581,620 to Yamazaki et al. Also, paragraph 6 of the Official Action rejects claims 9-14, 23-28, 31-40, 46-48 and 56-59 as obvious based on the combination of Koji, Yamazaki and U.S. Patent 5,250,931 to Misawa et al.


As stated in MPEP § 2143-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

It is respectfully submitted that the Official Action has failed to show sufficient motivation to modify or combine the references to achieve the present invention. It should be noted that one feature of Koji is that the semiconductor island is directly formed on a roughened surface of an insulating substrate in order to improve light absorption of the semiconductor film. It is submitted that there has been an insufficient showing that one of skill in the art would have been motivated to combine reference teachings to realize the present invention and reconsideration is requested for this first reason.

Moreover, Yamazaki fails to teach a blocking layer formed on an insulating substrate, and Misawa also fails to teach that a semiconductor film is formed on a blocking layer located on an insulating substrate. Accordingly, even if the teachings of Koji, Yamazaki and Misawa are combined, it is impossible to obtain the claimed invention. That is, the prior art reference (or references when combined) fail to teach or suggest all the claim limitations and thus a *prima facie* case of obviousness cannot be maintained for this further reason.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,

  
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**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

**IN THE CLAIMS:**

Please amend claims 1, 5, 8, 9, 15, 19, 22, 23, 29, 31, and 36 as follows:

1. A device for [reading an image] sensing a light comprising:  
[a semiconductor layer formed on a substrate, said semiconductor layer comprising an image] a light sensor region and a semiconductor switch region adjacent to and operatively connected with said [image] light sensor region over an insulating substrate,

wherein a [said] semiconductor [layer has] region of the light sensor region and an active region of the semiconductor switch comprise the same semiconductor layer, the semiconductor layer having a semi-amorphous structure [comprising a mixture of amorphous and crystalline structures] formed on a blocking layer over the insulating substrate, and],

in which] wherein a Raman spectrum of the semiconductor [film] layer exhibits a peak deviated from that which stands for a single crystal of the semiconductor.

5. A device for [reading an image] sensing a light produced by a process comprising the steps of:

forming a blocking layer on an insulating substrate;  
depositing a semiconductor [material] layer on [a substrate] the blocking layer;

forming a photoelectric conversion semiconductor device on said substrate, a semiconductor region of the photoelectric conversion semiconductor device comprising a p-type impurity semiconductor region, an intrinsic semiconductor region, and an n-type impurity semiconductor region[, a semiconductor region of said photoelectric conversion semiconductor device being made of said semiconductor material]; and

forming a thin film transistor [on said substrate which constitutes an electric circuit required to read an image, a semiconductor region of said thin film

transistor being made of said semiconductor material] for driving the photoelectric conversion semiconductor device over the substrate, an active layer of the thin film transistor comprising a source region, a drain region, and a channel region;

wherein said semiconductor regions are arranged in order with said p-type impurity semiconductor region adjacent said intrinsic semiconductor region and said intrinsic semiconductor region adjacent said n-type impurity semiconductor region in said photoelectric conversion semiconductor device, said order being in a direction perpendicular to that in which [an image] a light to be [read] sensed is incident thereon, and

wherein the semiconductor region of the photoelectric conversion semiconductor device and the active layer of the thin film transistor comprises the same semiconductor layer.

8. (Amended) A device for [reading an image] sensing a light comprising:  
[a semiconductor layer formed on a substrate, said semiconductor layer comprising an image] a light sensor region and a semiconductor switch region adjacent to and operatively connected with said [image] light sensor region over an insulating substrate,.

wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch region comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

wherein said semiconductor layer has at least one of an electron mobility 15-[100] 300 cm<sup>2</sup>/Vsec and a hole mobility 10-[100] 200 cm<sup>2</sup>/Vsec.

9. A device for [reading an image] sensing a light comprising:  
[a semiconductor layer formed on a substrate, said semiconductor layer comprising an image sensor] a light sensor region and a semiconductor switch region adjacent to and operatively connected with said [image sensor] light sensor region over an insulating substrate,

wherein [said] a semiconductor [layer has a semi-amorphous structure] region of the light sensor region and an active region of the semiconductor switch region

comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

[in which] wherein a Raman spectrum of the semiconductor [film] layer exhibits a peak deviated from that which stands for a single crystal of the semiconductor, and said semiconductor switch region comprises complementary p-channel and n-channel thin film transistors.

15. (Amended) A device for reading an image comprising:

an image sensor region and a semiconductor switch region adjacent to and operatively connected with said image sensor region over an insulating substrate,

wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch region comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

wherein said semiconductor layer has a semi-amorphous structure comprising a mixture of amorphous and crystalline structures, in which a Raman spectrum of the semiconductor film exhibits a peak deviated from that which stands for a single crystal of the semiconductor.

19. (Amended) A device for reading an image produced by a process comprising the steps of:

forming a blocking layer on an insulating substrate;

depositing a semiconductor layer on the blocking layer;

forming a photoelectric conversion semiconductor device on said substrate, a semiconductor region of said photoelectric conversion semiconductor device comprising a p-type impurity semiconductor region, an intrinsic semiconductor region, and an n-type impurity semiconductor region; and

forming a thin film transistor on said substrate, an active region of the thin film transistor comprising a source region, a drain region, and a channel region,

wherein the semiconductor region of said photoelectric conversion semiconductor device and the active region of the thin film transistor comprise the same semiconductor layer, and

wherein said semiconductor regions are arranged in order with said p-type impurity semiconductor region adjacent said intrinsic semiconductor region and said intrinsic semiconductor region adjacent said n-type impurity semiconductor region in said photoelectric conversion semiconductor device, said order being in a direction perpendicular to that in which an image to be read is incident thereon.

22. (Amended) A device for reading an image comprising:

an image sensor region and a semiconductor switch region adjacent to said operatively connected with said image sensor region over an insulating substrate,

wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch region comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

wherein said semiconductor layer has at least one of an electron mobility 15-300 cm<sup>2</sup>/Vsec and a hole mobility 10-200 cm<sup>2</sup>/Vsec.

23. (Amended) A device for reading an image comprising:

an image sensor and a semiconductor switch region adjacent to and operatively connected with said image sensor region over an insulating substrate,

wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch region comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

wherein said semiconductor layer has a semi-amorphous structure in which a Raman spectrum of the semiconductor film exhibits a peak deviated from that which stand for a single crystal of the semiconductor, and said semiconductor switch region comprises complementary p-channel and n-channel thin film transistors.

29. (Amended) A device for sensing a light comprising:

a light sensor region and a semiconductor switch region adjacent to and operatively connected with said light sensor region over an insulating substrate,

wherein a semiconductor region of the light sensor region and an active region of the semiconductor switch region comprise the same semiconductor layer formed on a blocking layer located on the insulating substrate, and

wherein said semiconductor layer has at least one of an electron mobility greater than  $15 \text{ cm}^2/\text{Vsec}$  and a hole mobility greater than  $10 \text{ cm}^2/\text{Vsec}$ .

31. (Amended) A semiconductor device comprising:

an insulating substrate;

a blocking layer on said insulating substrate;

first, second, and third semiconductor islands on said blocking layer;

p-type impurity regions in said first semiconductor island with a first channel region interposed therebetween and in a first region of said third semiconductor island;

n-type impurity regions in said second semiconductor island with a second channel region and in a second region of said third semiconductor island;

an insulating film on said first, second, and third semiconductor islands; and

first and second gate electrodes over said first and second channel regions, respectively, with said insulating film interposed therebetween,

wherein a Raman spectrum of each of said first, second, and third semiconductor islands exhibits a peak deviated from that which stands for a single crystal of the semiconductor.

36. (Amended) A device comprising:

an insulating substrate;

a blocking layer on said insulating substrate;

first, second, and third semiconductor islands on said blocking layer;

p-type impurity regions in said first semiconductor island with a first channel region interposed therebetween and in a first region of said third semiconductor island;

n-type impurity regions in said second semiconductor island with a second channel region and in a second region of said third semiconductor island;

an insulating film on said first, second, and third semiconductor islands; and



first and second gate electrodes over said first and second channel regions, respectively, with said insulating film interposed therebetween,

wherein said first semiconductor island has a mobility of 10-300 cm<sup>2</sup>/Vsec and said second semiconductor island has a mobility of 15-300 cm<sup>2</sup>/Vsec.